# WEST

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### **Search Results -** Record(s) 1 through 3 of 3 returned.

1. Document ID: JP 2000281864 A

L3: Entry 1 of 3

File: DWPI

Oct 10, 2000

DERWENT-ACC-NO: 2001-074473

DERWENT-WEEK: 200117

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molding material.

PRIORITY-DATA: 1999JP-0091681 (March 31, 1999)

PATENT-FAMILY:

PUB-NO

PUB-DATE

LANGUAGE

PAGES

MAIN-IPC

JP 2000281864 A

October 10, 2000

012

C08L059/00

INT-CL (IPC): C08 K 3/34; C08 K 5/17; C08 K 9/04; C08 L 59/00; C09 C 1/40

Full Title Citation Front Review Classification Date Reference Sequences Attachments

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FRANC

2. Document ID: JP 04239049 A

L3: Entry 2 of 3

File: DWPI

Aug 26, 1992

DERWENT-ACC-NO: 1992-335433

DERWENT-WEEK: 199241

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TITLE: Acetal! polymer compsn. with high heat ageing properties - in which acetal! homopolymer is mixed with hindered phenolic antioxidant, <a href="mailto:amino-cpd">amino-cpd</a>. and formaldehyde

scavenger

PRIORITY-DATA: 1991JP-0001400 (January 10, 1991)

PATENT-FAMILY:

PUB-NO

PUB-DATE

LANGUAGE

PAGES

MAIN-IPC

JP 04239049 A

August 26, 1992

007

C08L059/00

INT-CL (IPC): C08K 5/13; C08K 5/17; C08L 59/02

Full Title Citation Front Review Classification Date Reference Sequences Attachments

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K/aviC

3. Document ID: JP 04239048 A

L3: Entry 3 of 3

File: DWPI

Aug 26, 1992

phenol B-1. The results are shown in Table 2. cated in Table 2 were used instead of sterically hindered

#### EXVWM E 13

shown in Table 2. an extrusion molding test was carried out. The results are obtaining pellets. With respect to the thus obtained pellets, extruded molten strands were cooled and pelletized, thereby was 100 rpm and the discharge rate was 30 kg/hour. The temperature was 210° C., the revolution rate of the screw dismeter of 40 mm, under conditions that the cylinder of a twin-screw extruder having an L/D ratio of 30 and a 10 mixer, and the resultant blend was melt-kneaded by means calcium laurate D-3 were blended together in a Hensehel weight of polyethylene C-3 and 0.1 part by weight of part by weight of sterically hindered phenol B-1, 0.3 part by 100 parts by weight of oxymethylene copolymer A-1, 0.3

#### Comparative Example 10

repeated except that calcium laurate D-4 was used instead of Substantially the same procedure as in Example 13 was

#### EXVMbl'E 1¢

molding test was carried out. The results are shown in Table lets. With respect to the thus obtained pellets, an extrusion strands were cooled and pelletized, thereby obtaining pelthe discharge rate was 30 kg/hour. The extruded molten 210° C., the revolution rate of the screw was 100 rpm and 40 mm, under conditions that the cylinder temperature was 35 serew extruder having an LAD ratio of 30 and a diameter of blend was melt-kneaded and extruded by means of a twinblended together in a Henschel mixer, and the resultant stearate D-1 and 0.05 part by weight of melamine E-1 were weight of polyethyiene C-3, 0.05 part by weight of calcium part by weight of sterically hindered phenol B-1, 0.2 part by  $100~\mathrm{parts}$  by weight of oxymethylene copolymer A-1, 0.3

#### EXAMPLES 15 and 16

results are shown in Table 3. indicated in Table 3 were used instead of melamine E-1. The repeated except that the formaldehyde-reactive substances Substantially the same procedure as in Example 14 was

#### Comparative Example 11

an extrusion molding test was carried out. The results are 65 obtaining pellets. With respect to the thus obtained pellets, extruded molten strands were cooled and pelletized, thereby was 100 rpm and the discharge rate was 30 kg/hour. The temperature was 210° C., the revolution rate of the screw diameter of 40 mm, under conditions that the cylinder a twin-screw extruder baving an L/D ratio of 30 and a resultant blend was melt-kneaded and extruded by means of F-I were blended together in a Henschel mixer, and the stearate D-1 and 0.5 part by weight of polyethylene glycol ss weight of polyethylene C-1, 0.05 part by weight of calcium part by weight of steneally hindered phenol B-1, 0.2 part by 100 parts by weight of oxymethylene copolymer A-1, 0.3

Shown in Table 3.

shown in Table 1. were used instead of polychylene C-L. The results are

#### Comparative Example 3

of esicium stearate D-1. The results are shown in Table 1. repeated except that calcium stearate D-2 was used instead Substantially the same procedure as in Example I was

#### Comparative Example 4

results are shown in Table 1. repeated except that polyethylene C-1 was not used. The Substantially the same procedure as in Example I was

#### Comparative Examples 5 and 6

changed as indicated in Table 1. The results are shown in repeated except that the amount of polyethylene C-1 was Substantially the same procedure as in Example 1 was

#### EXAMPLES 5 and 6

Table 1. changed as indicated in Table 1. The results are shown in repeated except that the amount of polyethylene C-1 was 25 calcium laurate D-3. The results are shown in Table 2. Substantially the same procedure as in Example I was

#### EXVMbles 1 to 3

shown in Table 2. were used instead of polychylene C-L. The results are repeated except that the polyethylenes indicated in Table 2 Substantially the same procedure as in Example 1 was  $^{30}$ 

#### Somparative Examples 7 and 8

shown in Table 2. were used instead of polyethylene C-L. The results are repeated except that the polyethylenes indicated in Table 2 Substantially the same procedure as in Example 1 was

#### Comparative Example 9

of calcium stearate D-1. The results are shown in Table 2. repeated except that calcium stearate D-2 was used instead 45 Substantially the same procedure as in Example 8 was

#### EXYMME 10

The results are shown in Table 2. obtained pellets, an extrusion molding test was carried out. pelletized, thereby obtaining pellets. With respect to the thus kg/hour. The extruded molien strands were cooled and the screw was 100 rpm and the discharge rate was 30 the cylinder temperature was 210° C., the revolution rate of ratio of 30 and a diameter of 40 mm, under conditions that extruded by means of a twin-screw extruder having an L/D mixer, and the resultant blend was melt-kneaded and calcium stearate D-1 were blended together in a Henschel weight of polyethylene C-8 and 0.1 part by weight of part by weight of sterically hindered phenol B-1, 0.3 pan by 100 parts by weight of oxymethylene copolymer A-1, 0.3

#### EXAMPLES II and 12

repeated except that the sterically hindered phenols indi-Substantially the same procedure as in Example 1 was

DERWENT-ACC-NO: 1992-335432

DERWENT-WEEK: 199241

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Acetal! polymer compsn. with high heat ageing properties - in which acetal!

polymer is mixed with hindered phenolic antioxidant and amino cpd,.

PRIORITY-DATA: 1991JP-0001399 (January 10, 1991)

PATENT-FAMILY:

PUB-NO

PUB-DATE

LANGUAGE

PAGES

MAIN-IPC

JP 04239048 A

August 26, 1992

800

C08L059/00

INT-CL (IPC): C08K 5/13; C08K 5/17; C08L 59/00

Full Title Citation Front Review Classification Date Reference Sequences Attachments

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Term	Documents
POLYACETAL.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	14283
POLYACETALS.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	7647
AMINO.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	485710
AMINOES.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	1
AMINOS.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	478
AMINOE.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	111
COMPOUND[DWPI,TDBD,EPAB,JPAB,USPT,PGPB]	118262
CPD[DWPI,TDBD,EPAB,JPAB,USPT,PGPB]	136894
CPDS[DWPI,TDBD,EPAB,JPAB,USPT,PGPB]	79762
COMPOUNDS[DWPI,TDBD,EPAB,JPAB,USPT,PGPB]	80884
(POLYACETAL AND AMINO COMPOUND [TI]).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	3

There are more results than shown above. Click here to view the entire set.

Display Format: -

**Change Format** 

Previous Page

Next Page

molding test was carried out. The results are shown in Table lets. With respect to the thus obtained pellets, an extrusion strands were cooled and pelletized, thereby obtaining pelthe discharge rate was 30 kg/hour. The extruded molten 210° C., the revolution rate of the screw was 100 rpm and 40 mm, under conditions that the cylinder temperature was serew extruder having an L. I ratio of 30 and a diameter of

Comparative Example 12

blend was melt-kneaded and extruded by means of a twinblended together in a Henschel mixer, and the resultant and 0.1 part by weight of ethylene bissiearyl amide F-2 were melamine E-1,0.5 part by weight of polychylene glycol F-1 weight of polyethylene C-1, 0.05 part by weight of part by weight of sterically hindered phenol B-1, 0.2 part by  $100~\mathrm{parts}$  by weight of oxymethylene copolymer A--1,0.3

Set Nam- side by sid		<u>Hit</u> <u>Count</u>	Set Name result set
DB = U	SPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR-YES; OP=ADJ		
<u>L14</u>	11 and 12 and reduced formaldehyde	7	<u>L14</u>
<u>L13</u>	11 and 12	1719	<u>L13</u>
<u>L12</u>	11 and 13	1	<u>L12</u>
<u>L11</u>	11 and 18	1	<u>L11</u>
<u>L10</u>	11 and 14	1	<u>L10</u>
<u>L9</u>	11 and 17	1	<u>L9</u>
<u>L8</u>	polyacetal near3 reduced formaldehyde	5	<u>L8</u>
<u>L7</u>	polyacetal near2 reduced formaldehyde	2	<u>L7</u>
<u>L6</u>	polyacetal near1 reduced formaldehyde	0	<u>L6</u>
<u>L5</u>	polyacetal near reduced formaldehyde	0	<u>L5</u>
<u>L4</u>	polyacetal near3 reduced formaldehyde	5	<u>L4</u>
<u>L3</u>	polyacetal near5 reduced formaldehyde	7	<u>L3</u>
<u>L2</u>	polyacetal	20778	<u>L2</u>
<u>L1</u>	monoethanolamine or diethanolamine or 2 amino 2 ethyl propanediol or 2 amino 2 methyl propanol or tris(hydroxymethyl)aminomethane or ethyl p aminobenzoate or methyl anthranylate or butyl m aminobenzoate	38147	<u>L1</u>

# **END OF SEARCH HISTORY**

#### INVENTION DELVIUED DESCRIBLION OF THE

oxymethylene polymer resin composition comprising: According to the present invention, there is provided an

(B) 0.05 to 2 parts by weight of a sterically hindered (A) 100 parts by weight of an oxymethylene polymer,

Actions of the proof of trom 0.1 of 2.0 minutes in decoration of the minutes. (C) 0.01 to 5 parts by weight of a low-density polyethphenol compound,

larger than 50 ppm by weight and a chlorine ion content. 15 salt of the fatty acid has a calcium ion content of not acid having 10 to 36 carbon atoms, wherein the calcium (D) 0.01 to 1.0 part by weight of a calcium salt of a fatty 'somutur

For easy understanding of the present invention, the (E2) containing a formaldehyde-reactive nitrogen atom. formaldehyde-reactive nitrogen atom and a polymer of a non-polymeric compound (E<sub>1</sub>) containing a reactive substance selected from the group consisting. (E) 0 to 2.0 parts by weight of at least one formaldehydeof not larger than 100 ppm by weight, and

(A) 100 parts by weight of an oxymethylene polymer, An oxymethylene polymer resin composition comprising: present invention are enumerated below.

esscutial teatures and various preferred embodiments of the

phenol compound, (B) 0.05 to 2 parts by weight of a sterically hindered

91cg 001 of 2.0 morl lo xabni tham a gaived at aly (C) of the figure of parts of a low-density polyeth-

of not larger than 100 ppm by weight, and larger than 50 ppm by weight and a chlorine ion content salt of the fatty acid has a celmum ion content of not is: acid having 10 to 36 carbon atoms, wherein the calcium (G) 0.01 to 1.0 part by weight of a calcium salt of a fatty

the oxymethylene polymer (A) is at least one polymer 2. The resin composition according to item 1 above, wherein (E2) containing a formaldehyde-reactive nitrogen atom. tormaldebyde-reactive nitrogen atom and a polymer of a non-polymeric compound (E<sub>1</sub>) containing a 40 reactive substance selected from the group consisting (E) 0 to 2.0 parts by weight of at least one formaldehyde-

plock copolymer of an oxymethylene copolymer. copolymer, a branched oxymethylene copolymer and a selected from the group consisting of an oxy-methylene 45

wherein the oxymethylene polymer (A) has a melt index of 3. The resin composition according to item 1 or 2 above,

hydroxyphenyl)-propionate], and 3,9-bis-[2-{3-(3-t-butyl-4hydrocinnamide), 1,6-hexanediol-bis-[3-(3,5-di-t-butyl-4hexamethylene-bis(3,5-di-t-butyl-4-hydroxy-5-di-t-butyl-4-hydroxyphenyl)-propionate], N,N'triethylene glycol-bis-[3-(3-1-butyl-5-methyl-4least one polymer selected from the group consisting of 3 above, wherein the hindered phenol compound (B) is at 4. The resin composition according to any one of items 1 to rom 0.1 to 150 g/10 minutes.

υγάτο κυ-5-πειηνίρης πυγίο το ρίο ρίο συγίο κυγ-1,1-60 hydroxyphenyl)-propionate], pentaerythrityl-tetrakis[3-(3, 55

4 above, wherein the hindered phenol compound (B) is  $\delta$ . The resin composition according to any one of items 1 to dimethylethyl]-2,4,8,10-tetraoxaspiro(5,5)undecane.

6. The resin composition according to any one of items 1 to relative to 100 parts by weight of component (A). present in an amount of from 0.1 to 1.0 part by weight,

5 above, wherein the low-density polyethylene (C) is at least

one polyethylene selected from the group consisting of a

7 above, wherein the low-density polyethylene (C) has a 8. The resin composition according to any one of items 1 to

100 parts by weight of component (A).

to 9 above, wherein the low-density polyethylene (C) is a 10. The resur composition according to any one of items I

high pressure low-density polyethylene.

to II above, wherein the calcium salt of fatty acid (D) is 12. The resin composition according to any one of items 1 calcium laurate, calcium stearate and acid calcium behenate. least one calcium saft selected from the group consisting of to 10 above, wherein the calcium salt of fatty acid (D) is at II. The resin composition according to any one of items I

present in an amount of from 0.02 to 0.5 part by weight,

formaldebyde, such as trioxane or letraoxane, with a

dehyde monomer or a cyclic oligomer of

atoms, which is obtained by copolymerizing a formal-

by weight of oxyalkylene units having 2 to 8 carbon (II) an oxymethylene copolymer containing 0.1 to 20 %

formaldehyde, such as a formaldehyde trimer

izing a formaldehyde monomer or a cyclic oligomer of

of oxymethylene units, which is obtained by polymer-

(1) an oxymethylene homopolymer consisting essentially

In the present invention, examples of oxymethylene poly-

The present invention will now be described below in

17. A shaped article obtained by cutting the extrusion

16. An extrusion molded article obtained from the resin

(E) is present in an amount of from 0 to 1.0 part by weight,

to 14 above, wherein the formaldehyde-reactive substance

15. The resin composition according to any one of items 1

selected from the group consisting of a poly-\beta-alanine and

mer; and the acrylamide polymer is at least one polymer

tormaldehyde polymer is a melamine/formaldehyde poly-

melamine; the amino-substituted triazine compound/

wherein the amino-substituted triazine compound is

14. The resin composition according to item 13 above,

compound/formaldehyde polymer, a polyamide resin

group consisting of an amino-substituted triazing

ntrogen atom is at least one polymer selected from the

dicyandiamide and an amino-substituted triaxine

compound selected from the group consisting of

formaldehyde-reactive nitrogen atom is at least one

the non-polymeric compound (E1) containing a

13. The resin composition according to any one of items I

25 relative to 100 parts by weight of component (A).

the polymer (E2) containing a formaldehyde-reactive

composition of item 1 above, which is a rod or a sheet.

relative to 100 parts by weight of component (A).

mers used as component (A) include:

and an acrylamide polymer.

compound, and

to 12 above, wherein:

molded article of item 16 above.

detail

a polyacrylamide.

(trioxane) or a formaldehyde tetramer (tetraoxane);

of solution the street of  $10.0\,\mathrm{mon}$  for the same as an 8 above, wherein the low-density polyethylene (C) is present

Of The resin composition according to any one of items I to

Emays £6.0 of 88.0 mort to trisnab a each analy

from 0.91 to 0.93 g/cm<sup>2</sup> and the linear low-density polyeththe high pressure low-density polycibylene has a density of

7. The resin composition according to item 6 above, wherein density polycihylene: high pressure low-density polyethylene and a linear low-

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## **Search Results -** Record(s) 1 through 7 of 7 returned.

\_\_\_\_ 1. Document ID: US 20020019469 A1

L14: Entry 1 of 7

File: PGPB

Feb 14, 2002

PGPUB-DOCUMENT-NUMBER: 20020019469

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020019469 A1

TITLE: Polyacetal resins with reduced formaldehyde odor

PUBLICATION-DATE: February 14, 2002

INVENTOR-INFORMATION:

NAME

CITY

STATE

RULE-47

Mori, Hiroshi

Tochigi-ken

DE

Kassal, Robert James Shinohara, Kenichi Wilmington Tochigi-ken US JP

JР

COUNTRY

US-CL-CURRENT: 524/247

Full Title Citation Front Review Classification Date Reference Sequences Attachments Claims KWIC Draw Desc Image

2. Document ID: US 4379862 A

L14: Entry 2 of 7

File: USPT

US-PAT-NO: 4379862

DOCUMENT-IDENTIFIER: US 4379862 A

TITLE: Process for the preparation of polyurethane resins using low molecular weight

polyhydroxyl compounds prepared by the condensation of formaldehyde

DATE-ISSUED: April 12, 1983

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Wagner; Kuno

Leverkusen

ZIF CODE

DE

US-CL-CURRENT: 521/158; 521/170, 528/76, 528/80, 528/85

Full Title Ottation Front Review Classification Date Reference Sequences Attachments Claims RMC Draw Descriptions

\_\_\_ 3. Document ID: US 4341909 A

I. A process for preparing a hydrazide of formula I We claim:

NT = Not Tested

where the substituents may be lower alkyl, lower

unsubstituted o-, m- or p-phenylene diredical lene diradical of 4 to 10 carbons or a substituted or of 2 to 10 carbons, an oxydialkylene or thiodialkydiradical of 1 to 14 carbons, an alkenylene diradical R3 is a direct bond, an alkylene or branched alkylene

B = Timuvin 770 Ciba Geigy's Di-(22.6.6-tetramethy)-4-piperidinyl) sebacate
ligatos. 1076 = Ciba-Geigy's octadecyl 3.5-Di-1-butyl-4-bydroxyhydrocinnamate

VV-Chek AM-346 = Ferro Corp's 2.4-Di-1-butyl-4-bydroxyhydrocinnamate

VV-Chek AM-346 = Ferro Corp's 2.4-Di-1-butyl-4-butyl-4-butyl-4-bydroxybenzoste

946 Ciba-Geigy's N.N'-Bia(2,2,6-6-tecramethy)-4-piperidinyl)-1,6-bezanodamine polymer with 2,4-6-tricbloro-1,3,5-trimethyl-1,2-pearana-

	Fail	> 50 < 52	>32		1.1	442	2:30	B	IIIAX
	Fail	>12 <52	SE	-	1.1	5++	28.2	¥	IIAX
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								\$10	CONTR
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P#55	2249	o\$> o <b>≯&lt;</b>	32		_	5442	2.53	1	IIX
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	FAIL	BRITTLE	DVX8.LU	ΩΛ-CHEK	IKGYNOX	PROPY.		DOUND	
	-SSV4	DAYS TO				POLY-		COM-	
								STVH	
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J.YBFE I

The results are summarized in Table 1. tion was considered passing.

was considered a failure and greater than 15% clonga-6 to 12 carbons, 2-cyanocthyl or a radical of forbars were then pulled on the Instron. A brittle break

5 to 12 carbons, aralkyl of 7 to 12 carbons, aryl of QUV under the same conditions for 60 days. The tensile R2 is hydrogen, alkyl of 1 to 10 carbons, cycloalkyl of I ensile bars were also exposed to UV-A bulbs in a R1 is hydrogen or lower alkyl of 1 to 4 carbons; group of 4 to 30 carbons; clouding of the surface of the tensile bars was also sikyl of 3 to 10 carbons or a polyalkylene oxide QUV time interval required to generate spotting and

cyanoethyl, hydroxyalkyl of 1 to 6 carbons, epoxysnapped before 15% clongation was obtained. The kyl-substituted carbamoyl of 2 to 13 carbons, 2was considered a brittle break when the tensile bar of 7 to 15 carbons, alkyl- aryl-, cycloalkyl- or araltle break in the Instron test was determined. A result 20 alkoxycarbonyl of 2 to 9 carbons, aryloxycarbonyl minimum QUV exposure time required to obtain a britcarbons, unsubstituted aryl acyl of 7 to 13 carbons, (Model 4204) according to ASTM Procedure 638. The aralkyl of 7 to 12 carbons, aliphatic acyl of 2 to 10 The tensile bars were pulled on an instrumented Instron alkenyl of 3 to 8 carbons, alkynyl of 3 to 8 carbons, and withdrawn periodically at the same time of day. sation cycle at 50° C. Samples were placed in the QUV 15 mula I, where cycle using UV-B bulbs at 60° C. and a 4-hour condenexposure times. The QUV operated with an 8-how light

2,214,147

R is hydrogen, oxy, hydroxy, alkyl of 1 to 20 carbons, Weathering Tester (Q Panel Company) for various The tensile bars were placed in a QUV Accelerated were included for comparison. 1076 and Ciba-Geigy's Chimasorb 944 and Tinuvin 770

ester-half amide of formula IV to the hydraxide of forand for sufficient length of time to convert the half zine or hydrazine hydrate at a sufficient temperature 10 with an equivalent amount or a slight excess of hydra-

approximately 0.25%. UV-Chek AM-340 was included The concentration of the Irganox 1076 (when used) was 57

in some blends as a synergist at a concentration of

Irganox 1076 and control samples containing Irganox 71.×11 tensile bars. A control sample containing only 25-ton injection molding machine at 400° F. into The pellets were injection molded in a Newbury 5

.%22.0

Record List Display

L14: Entry 3 of 7

File: USPT

US-PAT-NO: 4341909

DOCUMENT-IDENTIFIER: US 4341909 A

TITLE: Preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: July 27, 1982

INVENTOR - INFORMATION:

NAME

CITY

STATE ZIP CODE

COUNTRY

Schneider; Gottfried

Leverkusen

DE

Wagner; Kuno

Leverkusen

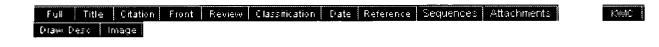
DE

Muller; Hanns P.

Leverkusen

DE

US-CL-CURRENT: <u>568/863</u>; <u>521/158</u>, <u>528/55</u>



### 4. Document ID: US 4301310 A

L14: Entry 4 of 7

File: USPT

US-PAT-NO: 4301310

DOCUMENT-IDENTIFIER: US 4301310 A

TITLE: Process for the preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: November 17, 1981

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Wagner; Kuno

Leverkusen

DE

US-CL-CURRENT: 568/863; 568/388, 568/463

Full Title Cita	ation Front F	Review   Classificati	on Date Referen	ce Sequences Attachments	: KWIC
Erraint Desc   Image		,			

#### 5. Document ID: US 4247653 A

L14: Entry 5 of 7

File: USPT

US-PAT-NO: 4247653

DOCUMENT-IDENTIFIER: US 4247653 A

TITLE: Process for the preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: January 27, 1981

INVENTOR - INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Wagner; Kuno

Leverkusen

DE

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ς

87

R3 is a direct bond or alkylene diradical of 1 to 14

Ro is methyl, ethyl or phenyl. carbons,

8 The process of claim 7 wherein the initial step

lected from the group consisting of inert hydrocarester acid chloride of formula III in a solvent se-(a) reacting the amine of formula II and the mono 12 further comprises

(b) separating the amine hydrochloride; bon, chlorinated hydrocarbon and ether;

amide of formula IV in a polar solvent selected (d) dissolving the isolated intermediate half ester-half formula IV; and (c) isolating the intermediate half ester-half amude of

9. The process of claim 8, wherein the amine of forpropanol, isopropanol and ethylene glycol. from the group consisting of methanol, ethanol,

mono ester acid chloride of formula III is ethyl oxalyl 30 mula 11 is 4-amino-2,2,6,6-tetramethylpiperidine and the

the intermediate half ester-haif amide of formula IV in the initial step by filtration, isolating and then dissolving 35 2,2,6,6-tetramethylpiperidine hydrochloride formed in mittal step further comprising removing 4-aminoacid chloride of formula III is ethyl oxalyl chloride, the 10. The process of claim 9, wherein the mono ester chloride or ethyl succinyl chloride

isolating the hydrazide of formula I by crystallization and 30° C. to form the hydraxide of formula I; and drazine hydrate at a temperature between 10 C. diate half ester-half amide of formula IV with hythe process further comprising reacting the intermemethanol or ethanol;

mula IV and hydrazine hydrate is conducted in methabetween the intermediate half ester-half amide of for-11. The process of claim 10 wherein the reaction from the methanol or ethanol.

12. The process of claim I further comprising an nol at a temperature between 20° C. and 30° C.

initial step of reacting an amine of formula II

with a dialkyl or diphenyl diester of formula VI

П

to form an intermediate half ester-half amide of formula

R is hydrogen, methyl or acetyl, 2 The process of claim 1 wherein K2 is lower alkyl of 1 to 6 carbons or phenyl. lower alkylmercapto; and alkoxy, hydroxy, bromo, chloro, mercapto or

R2 is hydrogen, alkyl of 1 to 10 carbons, or a radical R is hydrogen,

alumnoì lo

 $\mathbb{R}^3$  is a direct bond or alkylene diradical of 1 to 14  $_{20}$ 

R<sup>5</sup> is methyl, ethyl or phenyl.

(a) conducting the reaction in a polar solvent selected 3. The process of claim 2, further comprising

(b) isolating the compound of formula I by crystallipropanol, isopropanol and ethylene glycol, and from the group consisting of methanol, ethanol, 25

hydrogen,  $R^2$  is a direct bond and  $R^2$  is methyl or ethyl. 4. The process of claim 3 wherein R, R! and R' are solvent or by evaporation of the polar solvent. zation of the compound of formula I from the polar

and 30° C., and the hydraxide of formula I is isolated by methanol or ethanol, the temperature is between 10° C. 5. The process of claim 4 wherein the polar solvent is

tial step of reacting an excess of an amine of formula II 6. The process of claim 2, further comprising an inicavatallization from the polar solvent.

$$CH^{2}$$
  $CH^{3}K_{1}$   $K - M$   $C - CH^{3}$   $K_{5}$   $CH - M$   $CH - M$   $CH - M$   $CH^{2}$   $CH^{3}$   $CH^{3}$   $CH^{3}$   $CH^{3}$ 

II

with a mono ester acid chloride of formula III R is hydrogen or methyl, мретеш

isolating the half ester-half amide of formula IV. initial step to form an amine hydrochloride, and formula II reacts with the HCl formed during the of formula IV and HCl, whereby the amine of 60 to form as an intermediate the half ester-half amide

7. The process of claim 6 wherein

of formula  $\mathbf{K}^2$  is hydrogen, alkyl of 1 to 10 carbons, or a radical R is hydrogen, Full Title Citation Front Review Classification Date Reference Sequences Attachments Mode Ciram Desc Image

#### 6. Document ID: US 4219508 A

L14: Entry 6 of 7

File: USPT

US-PAT-NO: 4219508

DOCUMENT-IDENTIFIER: US 4219508 A

TITLE: Process for the preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: August 26, 1980

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Wagner; Kuno

Leverkusen

DE

 $\begin{array}{l} \text{US-CL-CURRENT: } \underline{568/387; } \underline{252/364}, \ \underline{252/73}, \ \underline{435/243}, \ \underline{435/247}, \ \underline{516/DIG.1}, \ \underline{516/DIG.2}, \\ \underline{521/107}, \ \underline{521/116}, \ \underline{521/158}, \ \underline{521/164}, \ \underline{521/168}, \ \underline{521/168}, \ \underline{528/85}, \ \underline{549/417}, \ \underline{549/450}, \ \underline{549/453}, \\ \underline{549/488}, \ \underline{554/223}, \ \underline{560/198}, \ \underline{560/263}, \ \underline{562/553}, \ \underline{562/561}, \ \underline{564/473}, \ \underline{568/388}, \ \underline{568/463}, \\ \underline{568/496}, \ \underline{568/679}, \ \underline{568/723}, \ \underline{568/833}, \ \underline{568/852}, \ \underline{568/863} \end{array}$ 

Full Title Citation	Front Review Classification	Date Reference Seque	nces Attachments
Draw Desc Image			

KWIC

# 7. Document ID: KR 2001112405 A WO 200059993 A1 EP 1171519 A1 US 20020019469 A1

L14: Entry 7 of 7

File: DWPI

Dec 20, 2001

DERWENT-ACC-NO: 2001-024449

DERWENT-WEEK: 200239

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TITLE: New polyacetal resin composition useful in molded articles comprises at least one odor reducing additive e.g. tris(hydroxymethyl)aminomethane or ethyl

one odor reducing additive e.g. <a href="mailto:tris(hydroxymethyl)aminomethane">tris(hydroxymethyl)aminomethane</a> or ethyl p-aminobenzoate

p-amiliobenzoace

INVENTOR: KASSAL, R J; MORI, H; SHINOHARA, K

PRIORITY-DATA: 1999US-0287432 (April 7, 1999), 2001US-0852383 (May 10, 2001)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
KR 2001112405 A	December 20, 2001		000	C08L059/00
WO 200059993 A1	October 12, 2000	E	018	C08K005/00
EP 1171519 A1	January 16, 2002	E	000	C08K005/00
US 20020019469 A1	February 14, 2002		000	C08L001/00

INT-CL (IPC):  $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{5/00}$ ;  $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{5:3445}$ ;  $\underline{\text{C08}}$   $\underline{\text{L}}$   $\underline{1/00}$ ;  $\underline{\text{C08}}$   $\underline{\text{L}}$   $\underline{59/00}$ ;  $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{5/00}$ ;  $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{\text{C08}}$   $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{\text{C08}}$   $\underline{\text{K}}$   $\underline{\text{C08}}$   $\underline{\text{C08$ 



V9#14#1900SA

# United States Patent [19]

Horio et al.

Nov. 14, 2000 Date of Patent: 941,741,8 Patent Number: [11]

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neget .	\$661/71	7-324155
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aeget.	0661/9	151991-7
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Attorney, Agent, or Firm—Birch, Stewart, Kolasch & Birch, Primary Examiner-Ariellion Sanders

**VBSTRACT** [LS]

properties and an excellent appearance. comprising microvoids and hence has excellent mechanical ably reduced content of whitened portions and void portions extrusion molded article produced therefrom has a remarkthe screw of an extruder during molding, but also in that an and exhibits excellent anti-slip properties when contacting geous not only in that it has excellent extrusion moldability The resin composition of the present invention is advanta molded article obtained from the above resin composition. formaldehyde-reactive nitrogen atom, and an extrusion reactive nitrogen atom and a polymer containing a non-polymeric compound containing a formaldehydereactive substance selected from the group consisting of a than 100 ppm by weight, and at least one formaldehyde-50 ppm by weight and a chlorine ion content of not larger of a fatty acid has a calcium ion content of not larger than acid having 10 to 36 carbon atoms, wherein the calcium salt index of 0.2 to 100 g/10 minutes, a calcium salt of a fatty phenol compound, a low-density polyethylene having a melt comprising an oxymethylene polymer, a sterically hindered Disclosed are an oxymethylene polymer resin composition

17 Claims, No Drawings

619,127	
<b>U.S. PATENT DOCUMENTS</b>	
References Cited	[99]
£22, 400, 4016,422	
Field of Search 524/100, 109, 109	[88]
254/310; 524/400	
U.S. Cl. <b>\$24/100</b> , \$24/109; \$24/223;	[25]
C08K 2/20, C08K 5/10, C08K 5/04	( )
Int. Cl.7 C08K 5/34; C08K 5/15;	[15]
287108-8 nøgel [41] 3001,£1	.voV
Foreign Application Priority Data	[06]
PCT Pub. Date: May 22, 1998	
PCT Pub. No.: WO98/21280	[78]
§ 102(c) Date: Mar. 25, 1999	
\$ 371 Date: Mar. 25, 1999	
PCT No.: PCT/JP97/04141	[98]
PCT Filed: Nov. 13, 1997	[55]
£97,692/60 noV AqqA	[17]
Assignee: Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, lapan	[٤٢]
Inventors: Mitsuhiro Horio; Toshiharu Seyama, both of Kurashiki, Japan	[5]
KEZIN COMBOZILION	[15]

#### FOREIGN PATENT DOCUMENTS

0.289.142.A2 11/1988 European Pat. Off. .

#### End of Result Set

**Print** Generate Collection

L14: Entry 7 of 7

File: DWPI

Dec 20, 2001

DERWENT-ACC-NO: 2001-024449

DERWENT-WEEK: 200239

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TITLE: New polyacetal resin composition useful in molded articles comprises at least one odor reducing additive e.g. tris(hydroxymethyl)aminomethane or ethyl p-aminobenzoate

#### Basic Abstract Text (1):

NOVELTY - New polyacetal resin composition comprises at least one odor reducing additive. The additive is a low molecular weight primary or secondary amino compound of low volatility, succinimide, anthranilic acid and/or 4-amino benzoic acid.

#### Basic Abstract Text (2):

DETAILED DESCRIPTION - New\_polyacetal resin composition comprises a polyacetal resin (a) and at least one odor-reducing additive (b). (b) is a low molecular weight primary or secondary amino compound of low volatility, succinimide, anthranilic acid and/or. 4-amino benzoic acid. The amino compound contains at least one amino group and at least two carbon atoms and has a weak basicity of Pkb 2-8. The resin composition has a formaldehyde concentration at room temperature of less than about 50% of the formaldehyde concentration of similar polyacetal compositions free of odor-reducing additive(s).

Basic Abstract Text (3):
An INDEPENDENT CLAIM is also included for reducing formaldehyde concentration from a molded part which involves blending (a) with (b) to form a blend with reduced formaldehyde concentration.

#### Basic Abstract Text (5):

ADVANTAGE - The composition has excellent heat stability, air aging and moldability as well as a reduced formaldehyde level for packaged resins and molded parts. The combination of the odor-reducing additive with a weak acidic imino compound provides a synergistic effect in further reducing the formaldehyde odor for packaged resins and molded parts.

## Equivalent Abstract Text (1):

NOVELTY - New polyacetal resin composition comprises at least one odor reducing additive. The additive is a low molecular weight primary or secondary amino compound of low volatility, succinimide, anthranilic acid and/or 4-amino benzoic acid.

#### Equivalent Abstract Text (2):

DETAILED DESCRIPTION - New polyacetal resin composition comprises a polyacetal resin (a) and at least one odor-reducing additive (b). (b) is a low molecular weight primary or secondary amino compound of low volatility, succinimide, anthranilic acid and/or 4-amino benzoic acid. The amino compound contains at least one amino group and at least two carbon atoms and has a weak basicity of Pkb 2-8. The resin composition has a formaldehyde concentration at room temperature of less than about 50% of the formaldehyde concentration of similar polyacetal compositions free of odor-reducing additive(s).

#### Equivalent Abstract Text (3):

An INDEPENDENT CLAIM is also included for reducing formaldehyde concentration from a molded part which involves blending (a) with (b) to form a blend with reduced formaldehyde concentration.

25 be used individually or in combination. preferred. These sterieslly hindered phenol compounds can dimethylethyl]-2,4,8,10-tetraoxaspiro(5,5)undecane are hydroxy-5-methylphenyl)-propionyloxy}-1,1hydroxyphenyl)-propionate] and 3,9-bis-[2-{3-1-butyl-4hydrocinnamide), 1,6-hexanediol-bis-[3-(3,5-di-t-butyl-4hexamethylene-bis(3,5-di-t-butyl-4-hydroxy-5-di-t-butyl-4-hydroxyphenyl)-propionate], N,N'hydroxyphenyl)-propionatel, pentaerythrityl-tetrakia[3-(3, 15 triethylene glycol-bis-[3-(3-t-butyl-5-methyl-4hydrazine. Of these sterically hindered phenol compounds, N,N'-bis-[3-(3,5-di-t-butyl-4-hydroxyphenol)propionyl]bis(3-t-butyl-5-methyl-4-hydroxy-bydrocinnamide) and methyl-4-hydroxyphenyl)propionate, N,N'-hexamethylene-10 hydroxyphenyl)propionate], octadecyl-3-(3-t-butyl-5pentaerythritol-tetrakis[3-(3-t-butyl-5-methyl-4-1-pnill-2-melbyl-4-bydroxyphenyl)-propionate], pydroxy-5-t-butylphenyl)butane, 1,6-hexanediol-bis-{3-(3bis(4-ethyl-6-t-butylphenol), 1,1,3-tris(2-methyl-4methylene-bis(4-methyl-6-t-butylphenol), 2,2'-methylenedimethylethyl]-2,4,6,10-tetraoxaspiro( $\zeta,\zeta$ )undecane, 2,2'--1-1-1-4-hydroxy-5-methylphenyl)-propionyloxy-1-1-(3,5-di-t-butyl-4-hydroxybenzyl)benzene, 3,9-bis-[2-{3-(3-

practical use. so that the resultant molded article is not suitable for marked discoloration in a molding machine during molding, parts by weight, the resin composition is likely to suffer the sterieally hindered phenol conspound is larger than 20 sion moldability cannot be obtained. When the amount of 0.05 part by weight, satisfactory heat resistance and extruof the sterically hindered phenol compound is smaller than oxymethylene polymer as component (A). When the amount  $_{30}$  part by weight, relative to 100 parts by weight of the 0.1 of 1.0 mony freeleably, preferably from 0.1 to 1.0 used in the present invention is generally in the range of The amount of the sterically hindered phenol compound

sisting of a high pressure low-density polyethylene and a of at least one polyethylene selected from the group conresin composition of the present invention, use can be made As the low-density polyethylene component (C) of the

.ºmɔ\g £€.0 oi 1€.0 low-density polyethylene is generally in the range of from table to that of a main chain. The density of the high pressure is caused to have long branchings having a length compareaction, so that the high pressure low-density polyethylene occur due to an intermolecular hydrogen abstraction Also, during the radical polymerization, long branchings oxymethylene. In the present invention, the melt index is 55 the obtained high pressure polyethylene has a low density. "back biting". Due to the presence of the short branchings, an inframolecular hydrogen abstraction reaction due to branching and butyl branching) from a main chain occur by low-density polyethylene, short branchings (such as ethyl the radical polymerization for producing a high pressure pressure in the range of from 1,000 to 3,000kg/cm2. During radical polymerization under a high pressure, namely a A high pressure low-density polyethylene is produced by

mer is copolymerized with an α-olefin, such as 1-butene, ylene is produced by a method in which an ethylene monopropionate], N,N'-hexamethylene-bis(3,5-di-t-butyl-4- 65 polymerization. Specifically, a linear low-density polyeth-A linear low-density polyethylene is produced by ionic

> as hydroxyl groups, carboxyl groups, amino groups, molecule thereof, a plurality of functional groups, such tetraoxane, in the presence of a compound having, in a oligomet of formaldehyde, such as trioxane or polymerizing a formaldehyde monomer or a cyclic (III) a branched oxymethylene homopolymer obtained by epichlorohydrin, 1,3-dioxolane or a diglycol formal; cyclic ether, such as ethylene oxide, propylene oxide,

acid anhydride groups, alkoxy groups and/or epoxy

ench as hydroxyl groups, carboxyl groups, amino in a molecule thereof, a plurality of functional groups, diglycol formal, in the presence of a compound having, propylene oxide, epichlorohydrin, glycol formal or tetraoxane, with a cyclic ether, such as ethylene oxide, oligomer of formaldehyde, such as trioxane or copolymerizing a formaldehyde monomer or a cyclic (IV) a branched oxymethylene copolymer obtained by

or at both ends thereof; and an alkoxy group or an epoxy group) at one end thereof boxyl group, an amino group, an acid anhydride group, a functional group (such as a hydroxyl group, a cartype, an amide type of a utethane type clastomer having telraoxane, in the presence of a styrene type, an ester a cyclic oligomer of formaldehyde, such as trioxane or optained by polymerizing a formaldehyde monomer or  $(\Lambda)$  a block copolymer of an oxymethylene homopolymer, cboxà groups;

groups, acid anhydride groups, alkoxy groups and/or

group, an alkoxy group or an epoxy group) at one end carboxyl group, an amino group, an acid anhydride having a functional group (such as a hydroxyl group, a ester type, an amide type or a urethane type elastomer or digiyeol formal, in the presence of a styrene type, an exide, propylene oxide, epichlorohydrin, glycol formal or tetraoxane, with a cyclic ether, such as ethylene or a cyclic oligomer of formaldehyde, such as trioxane obtained by copolymerizing a formaldehyde monomer (VI) a block copolymer of an oxymethylene copolymer,

An oxymethylene copolymer of item (II) above is more oxymethylene copolymet of item (VI) above are preferred. 45 linear low-density polyethylene. copolymet of item (IV) above and a block copolymet of an copolymer of item (II) above, a branched oxymethylene Of these oxymethylene polymers, an oxymethylene thereof or at both ends thereof

measured in accordance with ASTM-D1238-57T. preferably from 0.3 to 10 mol, relative to 100 mol of the comonomer content thereof is generally from 0.1 to 20 mol, respect to a copolymer type polyoxymethylene polymer, the minutes, preferably from 1 to 100 g/10 minutes. With the present invention is generally from 0.1 to 150 g/10 The melt index (MI) of the oxymethylene polymer used in

benzylphosphonate-diethylester, 1,3,5-trimethyl-2,4,6-tris pydroxy-hydrocinnamide), 3,5-di-1-butyl-4-hydroxypropionate], octadecyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)pentaerythrityl-tetrakis[3-(3,5-di-t-butyl-4-bydroxyphenyl)-[3-(3,5-di-t-butyl-4-hydroxyphenyl)-propionate],methyl-4-bydroxyphenyl)-propionate], 1,6-bexanediol-bisinvention include triethylene glycol-bis-[3-(3-t-butyl-5as component (B) of the resin composition of the present Examples of sterioally hindered phenol compounds used

Equivalent Abstract Text (5):

ADVANTAGE - The composition has excellent heat stability, air aging and moldability as well as a reduced formaldehyde level for packaged resins and molded parts. The combination of the odor-reducing additive with a weak acidic imino compound provides a synergistic effect in further reducing the formaldehyde odor for packaged resins and molded parts.

Standard Title Terms (1):

NEW POLYACETAL RESIN COMPOSITION USEFUL MOULD ARTICLE COMPRISE ONE REDUCE ADDITIVE TRI HYDROXYMETHYL AMINOMETHANE ETHYL P

preferred. fally acids, fauric acid, stearic acid and behenic acid are arachidonic acid, propiolic acid and stearolic acid. Of these

and the like, which are also present as impurities. chlorine ions are derived from, for example, NaCl, CaCl<sub>2</sub> and the like, which are present as impurities, and the calcium ions are derived from, for example,  $CaCl_2$ ,  $Ca(OH)_2$ generally contains both calcium ions and chlorine ions. The production process, and such calcium salt of a fatty acid is Renetally produced according to the below-described a calcium salt of a fatty acid having 10 to 36 carbon atoms melbanol, and therefore produces no calcium ion. However, position of the present invention, is insoluble in water and stoms, which is used as component (D) of the resin com-The calcium salt of a fatty acid having 10 to 36 carbon

in an extrusion molded article is increased when the calcium why the occurrence of whitened portions and void portions elucidation has not yet been made with respect to the reason the annealing of an extrusion molded article. Complete increased, but also in that discoloration tends to occur during portions and void portions in an extrusion molded article is lems arise not only in that the occurrence of whitened of component (D) is more than 100 ppm by weight, probss than 50 ppm by weight and/or when the chlorine ion content When the calcium ion content of component (D) is more tor determination of calcium ions and chlorine ions, if any. Thereafter, the resultant is subjected to ion chromatography to thereby dissolve therein any soluble impurities. is added to a methanol/water mixture (weight ratio of 1:1), chromatography. For example, a calcium salt of a fatty acid calcium salt of a fatty acid can be determined by ion The calcium ion content and the chlorine ion content of a obtaining the calcium salt of a fatty acid can be decreased. fally acid, the number of washing operations necessary for chlorine content is used for producing a calcium salt of a or less, respectively. When calcium hydroxide having a low become 50 ppm by weight or less and 100 ppm by weight until the calcium ion content and the chlorine ion content washed with water to remove calcium ions and chlorine ions The obtained calcium salt of the fatty acid is repeatedly by a reaction between a fatty acid and calcium hydroxide. becaused in which a calcium saft of a fare acid is produced acid used in the present invention can also be obtained by a by weight or less, respectively. The calcium salt of a fatty ion content become 50 ppm by weight or less and 100 ppm chlorine ions until the calcium ion content and the chlorine is repeatedly washed with water to remove calcinia ions and calcium chloride. The obtained calcium salt of the fatty acid by a reaction between a sodium salt of a fatty acid and a method in which a calcium salt of a fatty acid is produced 25 fatty acid used in the present invention can be obtained by by weight. Specifically, for example, the calcium salt of a chlorine ion content of substantially not larger than 100 ppm substantially not larger than 50 ppm by weight and a calcium salt of a fatty acid has a calcium ion content of 20 used in the present invention, as long as the obtained method for producing the specific calcium salt of a fatty acid There is no particular limitation with respect to the

satisfied. However, it has been found that, when a compan-

requirement both defined in the present invention is not

.<sup>e</sup>mo/g £6.0 of 88.0 most to ogust off density of the linear low-density polyethylene is generally in as to decrease the density of the resultant polymer. The thereby introducing short branchings into the main chain so by weight, based on the weight of the ethylene monomer, 22 snot leaves of 32 from several 32 to several tens 1-hexene, 4-methylpentene-1 or 1-octene, which is

present invention. tageously wery effective for achieving the effect of the of long branchings in the low-density polyethylene is advanpolyethylene. Therefore, it is also believed that the presence effect of the present invention than a linear low-density low-density polyethylene is more effective for achieving the the low-density polyethylene component, a high pressure position. On the other hand, it has also been found that, as structure of the low-density polyethylene in the resin comthe present invention has some relationship to the branching achieved. From this result, it is presumed that the effect of branches), the effect of the present invention cannot be substantially no short branches and substantially no long tion is replaced by a high-density polyethylene (which has polyethylene in the resin composition of the present invention. However, it has been found that, when the low-density extrusion molded article obtained from the resin composithe occurrence of whitened portions and void portions in an resin composition of the present invention serves to decrease mechanism in which the low-density polyethylene in the Elucidation has not yet been made with respect to the

to slip on the screw of an extruder during molding. of void portions is increased and the resin composition tends polyethylene is larger than 100 g/10 minutes, the occurrence unsatisfactory. When the melt index of the low-density portions in an extrusion molded article is likely to become suppression of the occurrence of whitened portions and void density polyethylene is smaller than 0.2 g/10 minutes, the O.5 to 90 g/10 missures. When the melt index of the lowthat the low-density polyethylene has a melt index of from index of from 0.2 to 100 g/10 minutes. It is more preferred It is preferred that the low-density polyethylene has a melt

unfavorable exfoliation and internal fine cracking tend to low-density polyethylene is more than 5 parts by weight, likely to become unsatisfactory. When the amount of the portions and void portions in an extrusion molded article is weight, the suppression of the occurrence of whitened of the low-density polyethylene is less than 0.01 part by oxymethylene polymer as component  $(\Lambda)$ . When the amount to 3 parts by weight, relative to 100 parts by weight of the range of from 0.01 to 5 parts by weight, preferably from 0.05 45 The amount of the low-density polyethylene is in the

occur in an extrusion molded article.

brassidic acid, sorbic acid, linoleic acid, linolenic acid, acid, oleic acid, claidic acid, cetoleic acid, erucic acid, Examples of unsaturated fatty acids include undecylenic 65 ion content requirement and/or the chlorine ion content acid, montanic acid, melissic acid and ceroplastic acid. acid, arachidic acid, behenic acid, lignoceric acid, cerotic capric acid, lauric acid, myristic acid, palmitic acid, stearic hydroxyl group. Examples of saturated fatty acids include carbon atoms. The fatty acid may be substituted with a salt of a saturated or unsaturated fatty acid having 10 to 36 the resin composition of the present invention, is a calcium The calcium salt of a fatty acid, used as component (D) of

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# **Search Results -** Record(s) 1 through 7 of 7 returned.

1. Document ID: US 20020019469 A1

L14: Entry 1 of 7

File: PGPB

Feb 14, 2002

PGPUB-DOCUMENT-NUMBER: 20020019469

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020019469 A1

TITLE: Polyacetal resins with reduced formaldehyde odor

PUBLICATION-DATE: February 14, 2002

INVENTOR - INFORMATION:

NAME

CITY

STATE

COUNTRY

RULE-47

Mori, Hiroshi

Tochiqi-ken

DΕ

JP US

Kassal, Robert James Shinohara, Kenichi

Wilmington Tochiqi-ken

J₽

US-CL-CURRENT: 524/247

Full Title Citation Front Review Classification Date Reference Sequences Attachments Drawi Desc Ilmage

2. Document ID: US 4379862 A

L14: Entry 2 of 7

File: USPT

US-PAT-NO: 4379862

DOCUMENT-IDENTIFIER: US 4379862 A

TITLE: Process for the preparation of polyurethane resins using low molecular weight

polyhydroxyl compounds prepared by the condensation of formaldehyde

DATE-ISSUED: April 12, 1983

INVENTOR - INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Wagner; Kuno

Leverkusen

DE

US-CL-CURRENT: <u>521/158</u>; <u>521/170</u>, <u>528/76</u>, <u>528/80</u>, <u>528/85</u>

Full Title Citation Front Review Classification Date Reference Sequences Attachments

Draw Desc Image

Document ID: US 4341909 A produced in accordance with the method disclosed in Unexthe presence of a radical polymerization catalyst can be mide or a derivative thereof with another vinyl monomer in catalyst and a copolymer obtained by polymerizing acryladerivative thereof in the presence of a radical polymerization A homopolymer obtained by polymerizing acrylamide or a Patent Application Laid-Open Specification No. 3-234729. 5,015,707, 5-87096 and 5-47568 and Unexamined Japanese The amount of the calcium salt (D) of a fatty acid is 25 Publication Nos. 6-12259 corresponding to U.S. Pat. No. methods disclosed in Examined Japanese Patent Application poly-b-alanine can be produced in accordance with the bolymers include poly-b-alanine and polyacrylamide. A catalyst, and the like. Preferred examples of acrylamide 20 monomer in the presence of a radical polymerization ixing acrylamide or a derivative thereof with another vinyl polymerization catalyst, a copolymer obtained by polymerlamide or a derivative thereof in the presence of a radical alcoholate, a homopolymer obtained by polymerizing acrywith another vinyl monomer in the presence of a metal obtained by polymerizing acrylamide or a derivative thereof thereof in the presence of a metal alcoholate, a copolymer mer obtained by polymerizing acrylamide or a derivative Examples of acrylamide polymers (3) include a homopoly--21-9/9 nolyn bas (01-6/6-10, and nylon 6-6-12. 6-12, nylon 12 and the like, and copolyamides thereof, such include nylon 4-6, nylon 6, nylon 6-6, nylon 6-10, nylon polymer and the like. Examples of polyamide resins (2) formaldehyde polymers include a melamine/formaldehyde polymer, Examples of amino-substituted trianing polymer, (2) a polyamide resin, and (3) an aerylamide amino-substituted triaxine compound formaldehyde component (E) in the present invention, include (1) an

containing a formaldehyde-reactive nitrogen atom is pref-The weight average molecular weight of the polymer  $(E_2)$ tion No. 3-28260.

the molding temperature is higher than usual or when the improving the heat resistance of the resin composition when composition of the present invention exhibits an effect of The formaldehyde-reactive substance (E) of the resin erably 500 or more, more preferably 5,000 or more.

resin composition suffers discoloration during the residence reactive substance (E) is more than 2.0 parts by weight, the component (A). When the amount of the formaldehydeto 100 parts by weight of the oxymethylene polymer as parts by weight, pretenably 0 to 1.0 part by weight, relative the resin composition of the present invention is 0 to 2.0 The amount of the formaldehyde-reactive substance (E) in

combination. These additives can be used in an amount and the like. These additives can be used individually or in light stabilizer), a lubricant (mold release agent), a pigment additives include a weathering stabilizer (for example, a ventional oxymethylene polymers can be used. Examples of In the present invention, various additives used for conof the composition in a molding machine.

(II) an oxalic anilide type compound and (III) a hindered As light stabilizers, (I) a benzotriazole type compound, nansily employed in the art.

2-(2'-hydroxy-5'-methyl-phenyl)benzotriazole, 2-(2'-Examples of benzotriazole type compounds (1) include 65 amine type compound are preferred.

> portion in the resultant molded article. speed affects the occurrence of a whitened portion and a void composition during molding and, in turn, the solidification composition influences the solidification speed of the resin bicanined that the number of crystal nuclei in the resin rine ion content requirements) From this finding, it is any of the above-mentioned calcium ion content and chlothan the number of spherulites in the latter (not satisfying and chlorine ion content requirements) is apparently smaller (satisfying both the above-mentioned calcium ion content tent requirements, the number of spherulites in the former above-mentioned calcium ton content and chloring ton conpolymer resin composition which does not satisfy any of the an extrusion molded article produced from an oxmethylene cium ion content and chlorine ion content requirements and composition which satisfies both the above-mentioned calmolded article produced from an exmethylene polymer resin diameter of 100 µm or more) is made between an extrusion son with respect to the number of spherulites (having a

of a fatty acid are as low as possible, most advantageously ion content and chlorine ion content of the calcium saft (I) In the present invention, it is preferred that the calcium

generally in the range of from 0.01 to 1.0 part by weight, O ppm by weight.

parts by weight of the oxymethylene polymer. preferably from 0.02 to 0.5 part by weight, relative to 100

molded article. discoloration occurs during the anneating of an extrusion 25 amined Japanese Patent Application Laid-Open Specifica-(U) of a fally acid is larger than 1.0 part by weight, vigorous tion is unsatisfactory. When the amount of the calcium salt (I) for improving the heat resistance of the resin composiis smaller than 0.01 part by weight, the effect of component When the amount of the calcium salt (D) of a fatty acid.

are preferred. bolymeric compounds  $(E_1)$ , dicyandiamide and melamine N-tetracyanoethylbenzoguanamine. Of these non-'.N'N діяшіпо-гуш-[гіяліпс sym-triazine, 2,4-dioxy-6-amino-sym-triazine, 2-oxy-4,6diamino-6-chloro-sym-triazine, 2,4-diamino-6-mercaptotriazine, 2,4-diamino-6-cyclobexyl-sym-triazine, 2,4penzyloxy-sym-triazine, 2,4-diamino-6-buloxy-sym-2-4-diamino-6-bulyl-sym-friazine, 2,4-diamino-6phenyl-sym-trazine), 2,4-diamino-6-methyl-sym-triazine, 55 frimethylolmelamine, benzoguanamine (2,4-diamino-6-N-methylolmelamine, N,N'-dimethylolmelamine, N,N',N"diallylmelamine, N,N',N"-triphenylmelamine, M-phenylmelamine, M,M-diphenylmelamine, M,Mmelamine (2,4,6-triamino-sym-triazine), N-butylmelamine, pounds (2) include guanamine (2,4-diamino-sym-triazine), compounds. Examples of amino-substituted inazine cominclude (1) dicyandiamide and (2) amino-substituted triazine combound. Examples of non-polymenc compounds  $(E_1)$  45 processing speed is very low. compound  $(E_1)$  is a monomene compound or an oligomene tormaldehyde-reactive nitrogen atom. The non-polymenc reactive nitrogen atom and a polymer (E2) containing a polymeric compound  $(E_1)$  containing a formaldehydeenpayance sejected from the group consisting of a noninvention, use is made of at least one formaldehyde-reactive As component (E) of the resin composition of the present

a formaldehyde-reactive nitrogen atom, which are usable as On the other hand, examples of polymers (E2) containing

Roord List Display

L14: Entry 3 of 7

File: USPT

US-PAT-NO: 4341909

DOCUMENT-IDENTIFIER: US 4341909 A

TITLE: Preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: July 27, 1982

INVENTOR-INFORMATION:

CITY STATE ZIP CODE NAME

Leverkusen

COUNTRY

Schneider; Gottfried Wagner; Kuno

Leverkusen DE

Muller; Hanns P. Leverkusen

US-CL-CURRENT: <u>568/863</u>; <u>521/158</u>, <u>528/55</u>



### 4. Document ID: US 4301310 A

L14: Entry 4 of 7

File: USPT

US-PAT-NO: 4301310

DOCUMENT-IDENTIFIER: US 4301310 A

TITLE: Process for the preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: November 17, 1981

INVENTOR - INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

DE

DE

Wagner; Kuno Leverkusen DE

US-CL-CURRENT: 568/863; 568/388, 568/463

Full Title Citation Front Review Classification Date Reference Sequences Attachments Draw Desc Image

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L14: Entry 5 of 7

File: USPT

ZIP CODE

US-PAT-NO: 4247653

DOCUMENT-IDENTIFIER: US 4247653 A

TITLE: Process for the preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: January 27, 1981

INVENTOR-INFORMATION:

NAME CITY

STATE

COUNTRY

Wagner; Kuno

Leverkusen

DE

2-hexyldecanol, 2-isoheptylundecanol, 2-octyldodecanol, alcohol, behenyl alcohol, ceryl alcohol, melissyl alcohol, stearyl alcohol, olcyl alcohol, nonadecyl alcohol, icosyl pentadecyl alcohol, cetyl alcohol, heptadecyl alcohol,

2-decylietradecanol and 2-methylstearyl alcohol.

sorbitan, sorbitol and mannitol. threitol, crythritol, pentacrythritol, arabitol, ribitol, xylitol, pentanediol, bexanediol, glycerol, diglycerol, triglycerol, glycol, propylene glycol, dipropylene glycol, butanediol, include ethylene glycol, diethylene glycol, triethylene carbon atoms can be used. Examples of polyhydric alcohols: As polyhydric alcohols, those alcohols having 2 to 6

Among esters obtained from an alcohol and a fatty acid, sciqs may or may not be substituted with a hydroxyl group. fatty acids, and a mixture of these fatty acids. These aliphatic acid and stearolic acid, natural fatty acids containing these elaidic acid, cetoleic acid, erucic acid, brassidic acid, sorbic melissic acid, ceroplastic acid, undecylenic acid, oleic acid, behenic acid, lignoceric acid, cerotic acid, montanic acid, itic acid, stearic acid, hydroxystearic acid, arachic acid, agents) include capric acid, lauric acid, myriatic acid, palm-Examples of fatty acids as lubricants (mold release

acid or the like, there can be mentioned a boric acid ester of acid ester containing a hydroxyl group blocked with bonc tanate and sorbitol trimontanate. As an example of a fatty glycol, an olefin compound having an average degree of 60 bitol tribehenate, sorbitol monomontanate, sorbitol dimontristearate, sorbitol monobehenate, sorbitol dibehenate, sorsorbitol monostearate, sorbitol distearate, sorbitol monopalminate, sorbitol dipalminate, sorbitol tripalminate, dimontanate, sorbitan trimontanate, sorbitol 55 bitan tribebenate, sorbitan monomontanate, sorbitan fristearate, sorbitan monobehenate, sorbitan dibehenate, sorsorbitan monostearate, sorbitan distearate, sorbitan monopalmitate, sorbitan dipalmitate, sorbitan tripalmitate, tol trimontanate, pentacrythrifol tetramontanate, sorbitan monomontanate, pentaerythritol dimontanate, pentaerythritribehenate, pentaerythritol tetrabehenate, pentaerythritol monobehenate, pentaerythritol dibehenate, pentaerythritol tristearate, pentacrythritol tetrastearate, pentacrythritol monostearate, pentaerythritol distearate, pentaerythritol tripalmitate, pentaerythritol tetrapalmitate, pentaerythritol monopalmitate, pentaerythrifol dipalmitate, pentaerythrifol glycerol dimontanate, glycerol trimontanate, pentaerythritol dibehenate, glycerol tribehenate, glycerol monomontanate, glycerol tristearate, glycerol monobehenate, glycerol tripalmitate, glycerol monostearate, glycerol distearate, glycerol monopalmitate, glycerol dipalmitate, glycerol or the like. Preferred examples of fatty acid esters include diester and a triester. Further, the fatty acid esters may example, the fatty acid esters can be any of a monoester, a acid esters may or may not contain a hydroxyl group. For glycerol, pentaerythritol, sorbitan and sorbitol. The fatty hydric alcohol selected from the group consisting of stearic acid, behenic acid and montanic acid, with a polyacid selected from the group consisting of palmitic acid, ferred is a fatty acid ester obtained by the reaction of a fatty 25 which are usable as lubricants (mold release agents), pre-

dicarboxylic acid, which are usable as lubricants (mold With respect to esters obtained from an alcohol and a

> benzotriazole and 2-(2-hydroxy-3,5-di-t-butyl-phenyl) hydroxy-3,5-bis(a,a-dimethylbenzyl)phenyl]-2Hbenzotriazole. Of these compounds, preferred are 2-[2benzottiazole and 2-(2'-hydroxy-4'-octoxyphenyl) hydroxy-3,5-bis(a,a-dimethylbenzyl)phenyl]-2Hhydroxy-3,5-di-isoamyl-phenyl)benzotriazole, 2-[2'hydroxy-3,5-di-t-butyl-phenyl)benzotriazole, 2-(2'-

> acid bisanilide. These compounds can be used individually 2'-ethyloxalic acid bisanilide and 2-ethoxy-3'-dodecyloxalic 2-ethoxy-2'-ethyloxalic acid bisanilide, 2-ethoxy-5-t-butyl-Examples of oxalic anilide type compounds (II) include benzotriazole.

Examples of hindered amine type compounds (III)  $^{\rm 15}$ or in combination.

Examples of lubricants (mold release agents) include an the oxymethylene polymer as component (A). 10.01 to 3 parts by weight, relative to 100 parts by weight of compounds (I), (II) and (III) is generally in the range of from (II) and (III) are used in combination, the total amount of the thereof can be arbitrarily selected. When the compounds (I), compounds (I), (II) and (III), the proportionate amounts compound (III) is most preferred. In a combination of the oxalic anilide type compound (II) and a hindered amine type A combination of a benzotnazole type compound (I), an type compounds can be used individually or in combination. 45 sebacate is preferred. The above-mentioned hindered amine these compounds, bis(2,2,6,6-tetramethyl-4-piperidyl)tetramethyl-4-piperidyl)-benzene-1,3,4-tricarboxylate. Of 4-piperidyl)-benzene-1,3,5-incarboxylate and tris(2,2,6,6hexamethylene-1,6-dicarbamate, tris(2,2,6,6-tetramethyldicarbamate, bis(2,2,6,6-tetramethyl-4-piperidyl)xylene, bis(2,2,6,6-tetramethyl-4-piperidyl)tolylene-2,4eihane, a.a.-bis(2,2,6,6-tetramethyl-4-piperidyloxy)-pbive olice than betteid zi didu quong kyantyh e nishoo 🙉 (yankhipaqiq-k-kyinmenol-kid,2,2)zid-2,1 (olichidame 4-piperidyl)-adipate, bis(2,2,6,6-tetramethyl-4-piperidyl)tetramethyl-4-piperidyl)-sebacate, bis(2,2,6,6-tetramethyl-(2,2,6,6-tetramethyl-4-piperidyl)-malonate, bis(2,2,6,6carbonate, bis(2,2,6,6-tetramethyl-4-piperidyl)-oxalate, bis tetramethylipipendine, bis(2,2,6,6-tetramethyl-4-pipendyl)-6-tetramethylpiperidine, 4-(phenylearbamoyloxy)-2,2,6,6tetramethylpiperidine, 4-(cyclohexylcarbamoyloxy)-2,2,6, tetramethylpiperidine, 4-(ethylcarbamoyloxy)-2,2,6,6tetramethylpiperidine, 4-phenoxy-2,2,6,6tetramethylpiperidine, 4-benzyloxy-2,2,6,6tetramethylpiperidine, 4-cyclohexyloxy-2,2,6,6tetramethylpiperidine, 4-stearyloxy-2,2,6,6tetramethylpiperidine, 4-methoxy-2,2,6,6tetramethylpiperidine, 4-benzoyloxy-2,2,6,6- 20 acid, linolenic acid, arachidonic acid, propiotic 2,2,6,6-tetramethylpiperidine, 4-(phenylacetoxy)-2,2,6,6-4-steatoyloxy-2,2,6,6-tetramethylpiperidine, 4-acryloyloxyinclude 4-acetoxy-2,2,6,6, -tetramethylpiperidine,

alcohol, lauryl alcohol, tridecyl alcohol, myristyl alcohol, capryl alcohol, nonyl alcohol, decyl alcohol, undecyl Examples of monohydric alcohols include octyl alcohol, 65 a glycerol monoester of a faily acid. agents) include both monohydric and polyhydric alcohols. Examples of alcohols for use as lubricants (mold release

dicarboxylic acid, a fatty acid amide, a polyoxyalkylene

a fatty acid, an exter obtained from an alcohol and a

alcohol, a fatty acid, an ester obtained from an alcohol and

polymerization of from 10 to 500, and silicone oil.

Full Title Citation Front Review Classification Date Reference Sequences Attachments
Draw Desc Image

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## 6. Document 1D: US 4219508 A

L14: Entry 6 of 7

File: USPT

US-PAT-NO: 4219508

DOCUMENT-IDENTIFIER: US 4219508 A

TITLE: Process for the preparation of low molecular weight polyhydroxyl compounds

DATE-ISSUED: August 26, 1980

INVENTOR-INFORMATION:

NAME Wagner; Kuno CITY

STATE

ZIP CODE

COUNTRY

Leverkusen

DE

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Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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# 7. Document ID: KR 2001112405 A WO 200059993 A1 EP 1171519 A1 US 20020019469 A1

L14: Entry 7 of 7

File: DWPI

Dec 20, 2001

DERWENT-ACC-NO: 2001-024449

DERWENT-WEEK: 200239

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TITLE: New polyacetal resin composition useful in molded articles comprises at least one odor reducing additive e.g. <a href="mailto:tris(hydroxymethyl)aminomethane">tris(hydroxymethyl)aminomethane</a> or ethyl p-aminobenzoate

INVENTOR: KASSAL, R J; MORI, H; SHINOHARA, K

PRIORITY-DATA: 1999US-0287432 (April 7, 1999), 2001US-0852383 (May 10, 2001)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
KR 2001112405 A	December 20, 2001		000	C08L059/00
WO 200059993 A1	October 12, 2000	E	018	C08K005/00
EP 1171519 A1	January 16, 2002	E	000	C08K005/00
US 20020019469 A1	February 14, 2002		000	C08L001/00

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The olefin compound having an average degree of polymerization of from 10 to 500, which is usable as a lubricant (mold release agent), is represented by the following for-

(1)

unjs (1):

wherein each of  $R^1$  and  $R^2$  independently represents a hydrogen atom, an alkyl group, an aryl group or an alkoxy group, and n represents an average degree of polymerization and is from 10 to 500.

cathon unsaturated bonds in the olefin compound to a nation treatment so as to decrease the number of carbonsubjecting the olefin compound to a conventional hydrogeto use a modified olefin compound which is obtained by ing the heat stability of the olefin compound, it is preferred merizing a diolefin monomer, from the viewpoint of increasmonomers. When the olefin compound is obtained by polytypes of monomers selected from these olefin and diolefin may be a copolymer obtained by copolymerizing 2 or more and cyclopentadiene. Alternatively, the olefin compound butadiene, 1,3-pentadiene, 1,4-pentadiene, 1,5-hexadiene diolefin monomers, such as allene, 1,2-butadiene, 1,3butene, 1-heptene, 1-octene, 1-nonene and 1-decene, and pniene, 2-methyl-2-butene, 1-hexene, 2,3-dimethyl-2-1-pentene, 2-pentene, 2-methyl-1-butene, 3-methyl-1ethylene, propylene, 1-butene, 2-butene, isobutylene, an olefin compound include olefin aionomers, such as pntyloxy group. Examples of monomers used for producing groups include an ethoxy group, a propyloxy group and a Stonb' a tolyl Stonp and a xylyl Stoup. Examples of ether b-nonylphenyl group, a benzyl group, a p-butylbenzyl p-pniylphenyl group, a p-ociylphenyl group, a Examples of aryl groups include a phenyl group, a group, a lauryl group, a cetyl group and a stearyl group. Examples of alkyl groups include an ethyl group, a propyl

It is necessary that the average degree of polymerization (n) of olefin monomer units constituting the olefin compound be in the range of from 10 to 500, preferably from 15 to 300. When the average degree (n) of polymerization is obefin compound tend to become low and mold deposit obefin compound tend to become low and mold deposit problems tend to occur. When the average degree of polymorization (n) is more than 500, the initial lubrication properties of the olefin compound tend to become low.

number as small as possible.

As preferred examples of alloone oils usable as lubricants of allowane and polymethyl phenyl siloxane, both represented by the following formula (2):

release agents), examples of alcohols used for forming an ester with a dicarboxylic acid include saturated and unsaturated alcohols, such as methyl alcohol, cityl alcohol, rebutyl alcohol, rebutyl alcohol, n-butyl alcohol, n-butyl alcohol, n-butyl alcohol, n-butyl alcohol, n-butyl alcohol, n-butyl alcohol, agentyl alcohol, myristyl alcohol, cetyl alcohol, stearyl alcohol and behenyl alcohol, stearyl alcohol and behenyl alcohol. Examples of dicarboxylic acids used for forming an ester Examples of dicarboxylic acids used for forming an ester bramples of dicarboxylic acids, glutaric acid, adipic acid, acid, maloric acid, suberic acid, sebacic acid, underenoit acid, brassidic acid, maleic acid, tunaric acid, brassidic acid, maleic acid, furnaric acid, undecennoic acid, brassidic acid, maleic acid, furnaric acid, and glutaconic acid.

As fally acid amides usable as lubricants (mold release agents), there may be mentioned fally acid amides obtained by reacting fally acide having 16 or more cation atoms with a stick used for forming a fally acid smide include palmitic acid, isopalmitic acid, stearic acid, isopalmitic acid, stearic acid, behaving acid, include acid, isopalmitic acid, actoric acid, isopalmitic acid, stearic acid, isopalmitic acid, isopalmitic acid, stearic acid, isopalmitic acid, stearic acid, isopalmitic acid, stearic acid, isopalmitic acid, isopalmitic acid, stearic acid, isopalmitic acid, isopa

polyethylene glycol monooleste (degree of polymenzation sie (degree of polymenzation of ethylene oxide: 2 to 50) and of ethylene oxide: 2 to 30), polyethylene glycol monostearpolyethylene glycol monolaurate (degree of polymerization Examples of polyoxyalkylene glycols of class (III) include polyoxyalkylene glycol of class (1) and a higher fatty acid. alkylene glycols of class (III) are esters obtained from a of polymerization of ethylene oxide: 4 to 50). The polyoxyto 100) and polyethylene glycol octyl phenyl ether (degree phenyl ether (degree of polymerization of ethylene oxide: 2 of ethylene oxide: 5 to 30), polyethylene glycol nonyl polyethylene glycol tridecyl ether (degree of polymerization (degree of polymerization of ethylene oxide: 5 to 30), of ethylene oxide: 5 to 30), polyethylene glycol lauryl ether polyethylene glycol stearyl ether (degree of polymerization 50 (degree of polymerization of ethylene oxide: 5 to 20), ethylene oxide: 5 to 50), polyethylene glycol cetyl ether polycthylene glycol oleyl ether (degree of polymerization of Examples of polyoxyalkylene glycols of class (II) include 45 bolyoxyalkylene glycol of class (I) and an aliphatic alcohol. alkylene glycols of class (II) are ethers obtained from a 1,000, more advantageously from 10 to 500. The polyoxythese polyoxyalkylene glycols is in the range of from 5 to pylene glycol. The preferred degree of polymerization of and a block polymer of polyethylene glycol and polyproclass (I) include polyethylene glycol, polypropylene glycol, sikylene glycols. Examples of polyoxyalkylene glycols of polyoxyalkylene glycols of class (I) are polycondensates of release agents) are classified into classes (I) to (III). The Polyoxyalkylene glycols usable as lubricants (mold

of ethylene oxide: 2 to 10).

enebisoleyi amide.